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American Petroleum Institute
1220 L Street, Northwest
Washington, D.C. 20005

Monthly Statistical Report

Prepared by the Statistics Department

Vol. 10, No. 7

AUGUST 13, 1986

JULY 1986

ESTIMATED U. S. PETROLEUM BALANCE SUMMARY

July deliveries of petroleum products rose 5.7 percent (875 thousand B/D) compared to last July, the largest year-to-year increase experienced so far this year. Recent trends suggest that the underlying growth rate is 4 to 5 percent, with increased gasoline consumption and continued fuel switching being two of the primary contributors.

Estimated crude oil production in the lower 48 declined nearly 230 thousand B/D year to year, though Alaskan production increased about 90 thousand B/D due to below-trend production last year. Total imports declined somewhat from June's level but were still 1.6 million B/D above last July as high crude oil imports continued. Refinery operations also declined from June's recent-year high, though utilization was still 3 percentage points ahead of last year. Total stocks rose 27 million barrels, largely due to a 19 million barrel increase in crude oil inventories.

PRODUCTS SUPPLIED[1/]

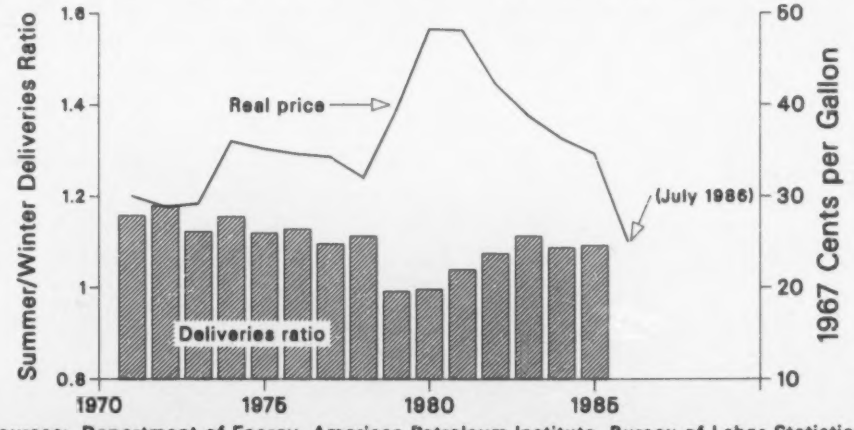
Gasoline

UP 4.5 PERCENT IN SUMMER'S FIRST TWO MONTHS.

Though gasoline deliveries' year-to-year gains have fluctuated in recent months — down a percent in May, up 3.3 percent in June, and now up 5.7 percent for July — the effect of this year's lower prices on gasoline use is becoming apparent. Motor gasoline deliveries' 400 thousand B/D rise in July brings the summer's average growth rate so far to 4.5 percent, the largest average June-July gain in eight years. This rate of increase appears to be a reasonable estimate of actual consumption gains when seasonal variations in price responsiveness are considered.

Figure 1

REAL GASOLINE PRICES AND SUMMER/WINTER DELIVERIES RATIOS



Sources: Department of Energy, American Petroleum Institute, Bureau of Labor Statistics, Platts Oil Price Handbook
Note: Summer is defined as June-August, Winter as the prior December-February.

Gasoline demand historically has been more price-responsive in the summer months than at other times of the year because of the greater proportion of recreational, vacation, and other "discretionary" driving in that season. As Figure 1 shows, the ratio of summer to winter gasoline deliveries trended downward in the 1970s in response to higher real gasoline prices. Similarly, declining prices in the past five years have corresponded with an upturn in summer gasoline deliveries relative to winter. These data suggest that this year's large price decline may also be having a more-than-proportional effect on summer gasoline demand.

That price decline continued in July, with retail prices falling 6-9 cents. This puts July's inflation-adjusted gasoline prices at half the early 1981 peak and, as the graph shows, below the level of real prices that existed prior to the 1973-74 oil embargo.

Distillate

ON-HIGHWAY DIESEL USE RISES. Distillate deliveries rose 2.3 percent (55 thousand B/D) in July, contrasting with the previous month's small decline. July's increase is essentially the same as the weather-adjusted, year-to-date gain. The principal consumption increase appears to be for on-highway diesel, with increases in trucking activity averaging about 5 percent in recent months.

Residual Fuel Oil

JUNE'S STRONG INCREASE REPEATED. Residual fuel oil deliveries rose strongly again in July, with the nearly 400 thousand B/D, 38 percent increase closely matching June's increase. For the year to date, residual fuel oil deliveries have increased nearly 17 percent (201 thousand B/D), contrasting with the 14 percent average annual decline of the previous five years.

Year-to-year growth in residual fuel oil deliveries has accelerated in recent months, largely because of lower prices and fuel switching. Early in the year, there was little net change in deliveries; from March to May, increases averaged near 200 thousand B/D; the most recent two months have experienced increases twice that amount. Bunkering has shown little year-to-year change so far in 1986 and any large impact from industrial fuel switching has not been apparent. However, additional utility purchases of residual fuel oil may have continued to rise from May's 220 thousand B/D year-to-year increase, since, despite consumption increases of 40 to 50 percent in March through May, utilities' inventories were still below year-ago levels. Thus, part of the recent surge in deliveries could well include replenishment of end-user stocks.

Kerosine Jet Fuel

DOWN DESPITE AIR TRAFFIC TRENDS. After June's unusually large increase of over 20 percent, July deliveries of kerosine jet fuel dropped a surprising 2.5 percent year-to-year. Air traffic data for the latest periods, however, continue to show strong growth — bringing into question whether the deliveries drop was related to any change in the upward trend of jet fuel consumption. Miles flown were up about 2 percent for the first five months of 1986 and available seat miles for June showed a 20 percent gain, though part of this increase is attributable to a strike during part of June 1985. It is likely that air traffic growth continued in July.

Other Oils

DELIVERIES DECLINE SLIGHTLY. Deliveries of all other oils fell slightly in July (0.8 percent or 33 thousand B/D). The latest Department of Energy data show petrochemical feedstocks continuing their strong growth of previous months with a 111 thousand B/D, 31 percent increase for May. Meanwhile, deliveries of liquefied petroleum gases again dropped, with declines for ethane and propane of 45 to 50 thousand B/D each, partially offset by a similar gain for butanes.

(In millions of B/D)	JULY ESTIMATES			YEAR-TO-DATE ESTIMATES		
	1986	1985	% Change	1986	1985	% Change
—Total domestic products supplied	16.3	15.4	5.7	16.0	15.6	2.5
—Motor gasoline supplied	7.4	7.0	5.7	7.0	6.8	2.1
—Distillate fuel oil supplied	2.5	2.4	2.3	2.9	2.9	1.4
—Residual fuel oil supplied	1.5	1.1	37.7	1.4	1.2	16.7

SUPPLY[1/]

Imports increased 1,625 thousand B/D and domestic supply rose 274 thousand B/D, bringing the increase in total supply for July to 1,899 thousand B/D.

Production

ALASKA UP, LOWER 48 DOWN. Estimated U.S. crude oil production declined about 140 thousand B/D compared to last July. However, a roughly 90 thousand B/D increase for Alaska (due to below-trend production last July) partially masked the nearly 230 thousand B/D decline for the lower 48.

Much of the decline is likely due to reduced upkeep of existing wells, though dramatically reduced drilling and shut-ins have also played a part in the decline. Well servicing activity has reportedly declined by more than 40 percent since late last year.

Imports

TOTAL UP 1.6 MMBD DUE TO CRUDE INCREASE. Though total imports for July declined about 160 thousand B/D from June's recent-year high, they were still some 1.6 million B/D above last year. The year-to-year increase was largely the result of crude oil imports close to June's high level and 1.3 million B/D above last July's. This high level of imports contributed significantly to July's above-normal inventory increase. Product imports also rose by more than 300 thousand B/D, the second monthly increase in a row.

Part of the increase in product imports is due to a rise in imports of residual fuel oil, which, after nearly a decade of decline, have been on an upward trend this year in response to growing demand. July's 366 thousand B/D increase brings the average rise for the past seven months to about 185 thousand B/D or 40 percent.

Distillate imports rose 149 thousand B/D in July, and imports of gasoline and components, though falling 124 thousand B/D from last July's high levels, were still about 50 thousand B/D above July 1984 imports.

Refinery Operations

DOWN FROM JUNE, UP FROM LAST JULY. Input to distillation units declined by roughly 400 thousand B/D from June's recent-year record, though utilization still averaged nearly 84 percent for the month — a 3-point gain over last year. This utilization rate is calculated on total operable capacity; approximately 400 thousand B/D of this capacity had been idle for more than a year at the beginning of 1986 — with 27 percent of the total in PAD I, 20 percent in both PADs II and III, 3 percent in PAD IV, and 30 percent in PAD V. If this idle capacity is excluded, the utilization rate rises to about 86 percent. Gasoline production, after showing gains of 8 and 5 percent in May and June respectively, rose 2.2 percent year-to-year in July and averaged over 6.9 million B/D.

Inventories

TOTAL STOCKS UP 27 MMB FROM JUNE. Total inventories rose 27 million barrels during July, well above the average 4 million barrel increase of the previous three years. Most of the increase was in crude oil stocks, which rose 19 million barrels as a result of continued high import levels in July. Product stocks rose 8 million barrels, despite a 5 million barrel decline for gasoline as the high rate of deliveries exceeded supplies from refineries and imports.

(In millions of B/D)	JULY ESTIMATES			YEAR-TO-DATE ESTIMATES		
	1986	1985	% Change	1986	1985	% Change
—Total supply	18.0	16.1	11.8	16.9	16.0	5.7
—Crude production[2/]	8.8	8.9	(1.6)	8.9	9.0	(1.0)
—Crude oil imports[3/]	4.3	3.0	44.1	3.7	2.9	27.7
—Product imports	2.1	1.7	17.8	1.9	1.8	1.1

1/ Total supply, i.e., production plus imports adjusted for net stock change is equal to total products supplied from primary storage. Total products supplied from primary storage less exports is equal to total domestic products supplied. Information contained in this report is derived from information published in the API Weekly Bulletin and is based on historical analysis of the industry. All data reflect the most current information available to the API and include all previously published revisions.

2/ Includes lease condensate.

3/ API data do not include crude oil imported for the Strategic Petroleum Reserve (SPR) nor crude oil stocks held in the SPR (according to the U.S. Department of Energy, the SPR held approximately 503 million barrels as of July 31, 1986).

ESTIMATED UNITED STATES PETROLEUM BALANCE

(Daily Average in Thousands of 42 Gallon Barrels)

Products Supplied/Supply From Primary Storage	JULY			YEAR-TO-DATE		
	1986[1]	1985[2]	% Change	1986[3R]	1985[2]	% Change
Products Supplied:						
Total motor gasoline	7,408	7,008	5.7	6,950	6,804	2.1
Finished leaded motor gasoline*	2,268	2,464	(8.0)	2,211	2,487	(11.1)
Finished unleaded motor gasoline*	5,140	4,544	13.1	4,739	4,317	9.8
Naphtha-jet	231	207	11.6	205	218	(6.0)
Kerosine-jet	984	1,009	(2.5)	1,052	971	8.3
Distillate fuel oil	2,491	2,436	2.3	2,940	2,899	1.4
Residual fuel oil	1,457	1,058	37.7	1,403	1,202	16.7
All other oils[4]	3,987	4,020	(0.8)	3,783	3,769	0.4
Reclassified[5]	- 249	- 304	(18.1)	- 300	- 225	33.3
Total domestic products supplied	16,309	15,434	5.7	16,033	15,638	2.5
Exports	770	675	14.1	786	738	6.5
Total products supplied	17,079	16,109	6.0	16,819	16,376	2.7
Supply:						
Domestic production:						
Crude oil[6]	8,810	8,949	(1.6)	8,912	9,000	(1.0)
Natural gas liquids	1,564	1,568	(0.3)	1,618	1,599	1.2
Other supply[7]	1,230	813	51.3	892	724	23.2
Total domestic supply	11,604	11,330	2.4	11,422	11,323	0.9
Imports:						
Crude oil, total	4,291[10/]	2,977[10/]	44.1	3,671[10/]	2,874[10/]	27.7
Canadian	592	385	53.8	552	461	19.7
Other	3,699	2,592	42.7	3,119	2,413	29.3
Products, total	2,058	1,747	17.8	1,856	1,835	1.1
Residual fuel oil	803	437	83.8	647	462	40.0
Other	1,255	1,310	(4.2)	1,209	1,373	(11.9)
Total imports	6,349	4,724	34.4	5,527	4,709	17.4
Total supply	17,953	16,054	11.8	16,949	16,032	5.7
Stock change, all oils	+ 874	- 55	XXXX	+ 130	- 344	XXXX
Refinery Operations						
Input to crude oil distillation units	13,091	12,663	3.4	12,694	11,987	5.9
Operable capacity	15,602	15,670	(0.4)	15,526	15,635	(0.7)
Refinery utilization (%)[8]	83.9%	80.8%	3.8	81.8%	76.7%	6.6
Crude oil runs	12,957	12,445	4.1	12,567	11,836	6.2

Stocks (millions bbls.)	1986		1985[2]	% Change from ...	
	July 31[9]	June 30[9]	July 31	Previous Month	Year Ago
Crude oil [10/]	340.9	321.5r/	327.0	6.0	4.3
Unfinished oils	108.2	112.6	111.9	(3.9)	(3.3)
Total motor gasoline**	222.3	227.2	226.5	(2.2)	(1.9)
Finished leaded motor gasoline*	71.8	73.3	80.0	(2.0)	(10.3)
Finished unleaded motor gasoline*	116.0	118.8	112.1	(2.4)	3.5
Naphtha-jet	5.5	6.0	7.0	(8.3)	(21.4)
Kerosine-jet	43.1	38.8	36.0	11.1	19.7
Distillate fuel oil	116.4	105.5	115.7	10.3	0.6
Residual fuel oil	39.7	38.7	40.5	2.6	(2.0)
All other oils	177.0	175.7r/	168.2	0.7	5.2
Total all oils	1,053.1	1,026.0r/	1,032.8	2.6	2.0

1/ Based on API estimated data converted to a monthly basis.
2/ Source: U.S. Department of Energy.
3/ Source: January-May, U.S. Department of Energy, June-July, API.
4/ Includes crude losses.
5/ Beginning with January 1981, U.S. Department of Energy began using a new data collection system which encompasses a method to ascertain the amount of product reclassified during the production phase. So that there will be no double counting of these volumes, they are subtracted from total domestic products supplied.
6/ Includes lease condensate.
7/ Includes unaccounted-for crude oil, refinery input of other hydrocarbons, and processing gain.
8/ Represents "Input to crude oil distillation units" as a percent of "Operable capacity."
9/ Derived by interpolating API weekly stocks data.
10/ Data do not include oil imported for the Strategic Petroleum Reserve (SPR) nor crude oil stocks held in the SPR.
R/ Revised.
* Included in motor gasoline.
** Includes finished leaded, finished unleaded, and motor gasoline blending components stocks.

PETROLEUM IMPORTS AND REAL GNP

This year's dramatic decline in petroleum prices has highlighted some of the already-existing pitfalls inherent in analyzing traditional GNP measures, and in particular, the role of the foreign trade components.

For example, according to preliminary figures released by the Department of Commerce on July 22, real Gross National Product (GNP), a measure of the country's output of goods and services, rose only 1.1 percent (at an annual rate) from the prior quarter. However, because of the large drop in international petroleum prices this year, the interpretation of traditionally-defined GNP as a measure of U.S. economic well-being has been distorted. When the data are re-expressed in terms of the U.S. economy's "command" over goods and services (see below), the second quarter's growth rate rises to as much as 3.0 percent. Next week's revisions may change the specific figures, but the divergence is likely to remain.

In addition, the recently-released figures showed a $23 billion increase in "real" imports (annual rate from the prior quarter), two-thirds of which was attributed to increased petroleum imports. This "increase", however, arises from the methodology used to calculate real GNP; in fact, in current dollars, the Commerce Department's preliminary data show only a $3 billion increase in imports and a $7 billion decline in expenditures for petroleum imports from the first quarter (annual rates).

What is GNP Measuring?

The traditional estimates of real GNP are intended to measure U.S. production of goods and services. Though GNP is expressed in dollars, in a sense it is actually an index of quantities; prices from a base period — 1982, currently — are used to convert quantities to a common measure so that output of many diverse goods and services can be combined into summary figures. This combined output can be calculated as the sum of consumption, investment (in structures, equipment, and inventories), and net exports (that is, the net difference between what was produced in the U.S. but shipped elsewhere and what was not produced yet consumed in the U.S.). It is a difference in treatment of this latter category that is the cause of the disparate growth rates cited above.

The most commonly-used GNP series published by the Department of Commerce converts international trade data to 1982 dollars by separately deflating exports by export prices for individual goods and services and imports by corresponding import prices. This produces a measure of GNP unaffected by changes in the terms of trade, as is appropriate if the series is to be used as a measure of domestic production. However, the resulting "real" trade balance figures are often difficult to meaningfully interpret and are even sometimes seemingly contradictory. As an extreme example, the traditional GNP accounts show that at times in the 1970s the U.S. was a net exporter on a nominal basis but simultaneously a net importer in 1982 real dollar terms.

A further example — as noted above, the preliminary GNP accounts for the second quarter show a $16 billion increase in real petroleum imports (annual rate from the prior quarter) when the current dollar value actually declined. Year-to-year comparisons display similar divergences; from second quarter 1985 to second quarter 1986, real petroleum imports rose 17 percent while actual expenditures fell about 40 percent. These divergences arise entirely from the fact that there was an increase in quantity in both cases (which is what the "real" figure is designed to measure) but an even larger percentage decline in prices. In terms of the U.S. position in international trade, the "real" increase is difficult to interpret, since expenditures for petroleum imports relative to the prices for other goods and services did, in fact, decline during the first half of 1986.

Thus, though the traditional approach to measuring GNP yields a measure of domestic output, changes in domestic output do not always parallel changes in economic well-being. Specifically, since oil prices now are roughly half of what they were last year, the U.S. needs to give up fewer resources in exchange for imported oil than it did before. However, since in the GNP accounts imports and exports are still valued at their 1982 prices (and oil is valued at over $31 per barrel), "imports" in 1982 dollars are substantially higher than when measured at current prices and net exports are consequently lower. These lower real net exports reduce real GNP as traditionally calculated.

Alternatives

The anomalous effect that the traditional approach to GNP accounting has on foreign trade data has been a subject of debate among economists for many years. A number of economists have argued that since the "command" the U.S. economy has over quantities of foreign goods and services depends not on prices from some prior period but on current relative prices of imports versus exports, a better measure of U.S. economic well-being can be constructed. This can be done by deflating imports and exports by a common price measure and thus preserving the terms of trade.

The Commerce Department publishes an alternative, "command-basis" GNP series in which net exports are deflated by the deflator for imports (see Edward Denison, "International Transactions in Measures of the Nation's Production", *Survey of Current Business,* May 1981, pp. 17-28). Geoffrey Moore ("Needed Improvements in Economic Statistics", *Business Economics,* July 1986, pp. 21-25), in calling attention to the anomalous trade figures produced by traditional GNP accounting, has proposed that net exports be deflated by the deflator for gross domestic purchases (GDP). GDP is GNP less net exports, so its deflator is a broader measure of price levels than the import deflator.

These "command-basis" measures provide meaningful information about U.S. economic conditions that the traditional figures do not. However, as Denison has noted, for analysing matters such as domestic productivity, the traditional measure is more appropriate.

Some Comparisons

Table 1 displays real GNP and net exports based on three different methodologies: the traditional Commerce Department estimates, Commerce's "command-basis" figures, and a series calculated according to Moore's GDP-based methodology. As the table shows, by the second quarter of 1986, the traditional measure of real net exports, i.e. the trade deficit, was nearly 40 percent higher than Commerce's "command" series and more than 70 percent higher than the GDP-based command series.

These differences can have a significant effect on the estimate of economic growth, as Table 2 shows. For 1985, estimated quarterly growth rates differ by half a percentage point or less, but this year's second quarter rates differ markedly. While the traditional series shows a substantial drop to 1.1 percent from the previous trend of roughly 3 percent growth, the two "command" series are less pessimistic. In fact, the GDP-based series produces an estimated rate of growth in the second quarter of 3.0 percent, suggesting that rather than slowing, the economy was essentially continuing the trend of prior quarters. Even over the space of the most recent four quarters, the GDP-based series estimates economic growth to be more than half a point greater than the traditional measure.

Conclusion

The traditional treatment of foreign trade in the GNP accounts, though it has its purpose, is not responsive to changes in the terms of trade and can lead to misleading conclusions. As this article has shown, alternative approaches to accounting for foreign trade can sometimes alter appraisals of the economy's strength significantly.

TABLE 1

REAL GNP AND COMMAND-BASIS GNP
(Billons of Dollars at Annual Rates)

	Real GNP			Real Net Exports		
	Traditional	Commerce Command Basis	GDP Command Basis	Traditional	Commerce Command Basis	GDP Command Basis
1985:I	$3,547.0	$3,574.1	$3,580.7	$ -78.8	$ -51.8	$-45.2
1985:II	3,567.6	3,594.8	3,605.8	-108.1	-80.9	-69.9
1985:III	3,603.8	3,629.5	3,642.2	-113.8	-88.1	-75.4
1985:IV	3,622.3	3,644.2	3,660.4	-132.0	-110.1	-93.9
1986:I	3,655.9	3,682.9	3,698.8	-125.9	-99.0	-83.1
1986:II	3,665.7	3,706.1	3,726.5	-146.3	-105.9	-85.1

Figures rounded independently.

TABLE 2

QUARTER-TO-QUARTER PERCENT CHANGE IN MEASURES OF REAL GNP
(Annual Rates)

	Traditional	Commerce Command Basis	GDP Command Basis
1985:I	3.1%	3.4%	3.3%
1985:II	2.3	2.3	2.8
1985:III	4.1	3.9	4.1
1985:IV	2.1	1.6	2.0
1986:I	3.8	4.3	4.3
1986:II	1.1	2.5	3.0
1985:II to 1986:II	2.7	3.1	3.3

Figures rounded independently.